

# METHODS FOR PATTERNING SUBSTRATES HAVING ARBITRARY AND UNEXPECTED DIMENSIONAL CHANGES

## ABSTRACT OF THE INVENTION

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Methods for patterning a plurality of electronic elements on a deformable substrate. The method uses an optical measurement device for optically measuring an existing geometric pattern on a substrate. The existing pattern is written on an  $n^{\text{th}}$  layer of the substrate. A computing device, coupled to the optical measurement device, calculates a correction between the existing geometric pattern and an expected pattern for the  $n^{\text{th}}$  layer. An image transformation component, coupled to the computing device, performs an image transformation on an electronic pattern to be used in an  $(n+1)^{\text{th}}$  layer, based on the calculated correction, to generate a corrected electronic pattern. A writing component, coupled to the image transformation component, writes the corrected electronic pattern onto the  $(n+1)^{\text{th}}$  layer using a programmable digital mask system. The writing component contains a radiation source which is coupled to an optical system for guiding radiation from the radiation source to the programmable digital mask and from there to the substrate.

20